Placing Nuclear Policy Discussions in the Proper Global Context

The Nuclear Energy Leadership Act (NELA)

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By Alan Ahn

The Nuclear Energy Leadership Act (NELA), re-introduced in the Senate on March 27th, is the latest in a recent line of proposed legislation concerning advanced nuclear--an unequivocal demonstration of broad, bipartisan support for nuclear energy innovation in Congress. NELA has been widely praised outside of Capitol Hill as well. Most notably, Bill Gates stated through social media that he was "thrilled" about the overwhelming congressional endorsement of advanced nuclear development; re-tweeting Senator Lisa Murkowski's public announcement of NELA, Gates remarked: "I can't overstate how important this is."

What does NELA aim to achieve?

NELA seeks to reestablish U.S. international leadership in nuclear power by facilitating advanced nuclear innovation through the following broad initiatives--extending the length of federal power purchase agreements to increase the viability of early commercial units, setting aggressive demonstration schedules for new designs, mandating the construction of a fast neutron research facility to test advanced fuels and materials, creating an initial supply of high assay low-enriched uranium (HALEU) fuel for advanced reactors, and developing a highly skilled workforce for the U.S. nuclear sector by supporting university nuclear science and engineering programs.

For all of NELA's acclaim, it remains uncertain as to how these aforementioned directives will play out in practice, considering the overarching objective of recapturing U.S. global standing in civil nuclear matters. Some advanced nuclear advocates are likely to argue that NELA's programmatic agenda--while beneficial--may not be sufficient, and that further measures will be required to foster a U.S. advanced nuclear industry that is internationally competitive. Indeed, as many of these technologies progress in their development, new challenges and needs--both technical and policy--

are bound to surface.

Reframing the nuclear dialogue

Although it would be unreasonable to judge the efficacy of NELA's initiatives in the short-term, there is something that NELA accomplishes almost immediately: incorporate foreign policy and geopolitical considerations into the discourse on nuclear energy in the U.S. In recent years, much of the discussions on nuclear power have generally been limited to domestic issues--the economic, environmental, and energy consequences of premature shutdowns within the U.S. fleet; relieving regulatory burdens upon U.S. nuclear operators; the general atrophy of the U.S. nuclear supply chain, workforce, and capabilities; etc.

While all of these issues are certainly important and relevant, a conversation solely focused on preserving American jobs and nuclear's role in maintaining power grid stability downplays the reverberating impacts that the health of the U.S. nuclear sector has globally. Furthermore, such a domestically-focused dialogue suggests that the pace of innovation should be commensurate with domestic needs and priorities.

However, U.S. laws and policies on nuclear energy cannot be made in a vacuum. Two global developments should fundamentally factor into U.S. decisions on nuclear, especially advanced nuclear R&D:

1) The vast proportion of global energy demand growth will occur outside of the U.S. and other OECD countries, and smaller advanced reactor designs possess characteristics that are advantageous in meeting this demand. For developing countries seeking to industrialize and also meet their environmental obligations, there are few options outside of nuclear. Furthermore, many advanced reactors are theoretically deployable in many developing regions, despite unique challenges (e.g. limited grid infrastructure, water scarcity issues, etc.).

2) Both Russia and China are committing substantial state resources to the development of next-generation nuclear technologies. Russia is widely considered the world leader in fast neutron reactor technologies, and as NELA states, is currently the only country that possesses fast neutron testing capabilities. Russia is also the pioneer in the deployment of floating reactors that can be quickly deployed to remote and distant regions. Similarly, China is devoting significant government funding towards a broad spectrum of reactor technologies, ranging from high-temperature gas-cooled reactors (HTGRs) to molten salt reactors (MSRs); reportedly, the levels of Chinese funding for some of these individual technologies surpass the budget for all nuclear energy R&D activities at U.S. national laboratories combined.

That nuclear innovation can occur organically, or at least, without consideration of these external developments, is an assertion that disregards reality. What NELA does emphatically is to place discussions of advanced nuclear R&D firmly in their proper global context.

Geopolitical stakes

According to certain market and energy demand projections, the global market for advanced nuclear has the potential to be massive. The text of NELA referred to a 2017 Department of Commerce report that stated that the worldwide civil nuclear market could be worth up to $740 billion over the next ten years.

While the theoretical business opportunities are impressive in terms of scale, the stakes involved extend far beyond the commercial figures. Significant U.S. participation in this burgeoning market will ensure that Washington maintains its voice in shaping international regimes governing the safe, secure, and responsible use of nuclear technologies. Ultimately, success or failure in this arena will have far-reaching impacts--not only on international carbon mitigation efforts and the economic prospects of the developing world, but on U.S. national security and geopolitical interests.

Such momentous stakes cannot be the responsibility of private industry alone--considering the ramifications for U.S. foreign policy and the international order, government must be involved.

And while nationalizing the nuclear industry in the manner of Russia or China should not be in play, there must at least be active coordination between the public and private sectors, if not a more robust public-private partnership, as many have advocated. At minimum, NELA outlines one vision for how government and industry can meaningfully interact in achieving mutual interests.

Perhaps NELA's greatest near-term contribution is to place these discussions in the proper perspective. While ensuring nuclear's share in the domestic energy mix is absolutely a valid driver for nuclear innovation, considering the larger picture, it must not be the only impetus for developing and commercializing advanced nuclear in the U.S.

Global America Business Institute | 1001 Connecticut Avenue NW, Suite 435, Washington, DC 20036 | 202-499-7979 | FLL@theGABI.com | www.theGABI.com